INTERNET

Internet as a tool to access high-risk men who have sex with men from a resource-constrained setting: a study from Peru

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Sex Transm Infect 2007;**83**:567–570. doi: 10.1136/sti.2007.027276

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Accepted 15 September 2007

Objectives: In Peru, current interventions in high-risk men who have sex with men (MSM) reach a limited number of this population because they rely solely on peer education. The objective of this study was to assess the use of the internet as an alternative tool to access this population.
Methods: Two nearly identical banner ads—both advertising an online survey but only one offering free HIV/syphilis tests and condoms—were displayed randomly on a Peruvian gay website.
Results: The inclusion of the health incentive increased the frequency of completed surveys (5.8% vs 3.4% of delivered impressions; $p<0.001$), attracting high-risk MSM not previously tested for HIV but interested in a wide variety of preventive Web-based interventions. Eleven per cent (80/713) of participants who said they had completed the survey offering free testing visited our clinic: of those who attended, 6% had already been diagnosed as having HIV, while 5% tested positive for HIV. In addition, 8% tested positive for syphilis.
Conclusions: The internet can be used as a tool to access MSM in Peru. The compensation of a free HIV/syphilis test increased the frequency of participation in our online survey, indicating that such incentives may be an effective means of reaching this population. However, as only a small percentage of participants actually reported for testing, future research should develop and assess tailored internet interventions to increase HIV/STI testing and delivery of other prevention services to Peruvian MSM.

In 2006, an estimated 2.9 million people lost their lives due to AIDS, and approximately 4.3 million were newly infected with HIV globally.[1] Men who have sex with men (MSM) are one of the populations that account for the greatest burden of the HIV epidemic in nearly all Latin American countries, the United States, Canada and some Western European countries. In Peru, as in other resource-limited settings, MSM is a group with very limited access to healthcare due to the scarce health resources assigned to this population as well as policies that contribute to stigma and discrimination.[2]

In Peru, the HIV prevalence among MSM is 14% at a national level and 22% in Lima, the capital of Peru[3 4] This HIV prevalence is by far the highest, compared with other marginalised populations, such as female sex workers who have a national prevalence of 0.6%.[5]

Some factors that contribute to the high HIV prevalence in MSM are the limited access that traditional programmes have to this population (in Peru only 18% of the MSM interviewed in the 2002 sentinel surveillance said they were approached by a peer educator during the last year) and the lack of innovative preventive interventions directed to this group.[2 5] In Peru, current programmes targeting MSM continue to rely solely on peer education at streets, discotheques, bathhouses, and other places frequented by this population.[5] Peer education not only reaches a very limited number of MSM but misses hidden MSM populations, such as closeted, younger, and bisexual MSM.[6] This not only contributes to the wider spread of HIV among this population but also increases HIV transmission to Peruvian heterosexual women as indicated by the decreased HIV male/female ratio from 22.5:1 in 1987 to 2.95:1 in 2006.[7]

Given the wide internet access in Peru and the increasing number of gay websites used for sexual and nonsexual purposes, the internet, named as ''the world's most extensive venue for sexual information and sex negotiation,'' demands further exploration as a way to deliver preventive interventions.[8 9]

In Peru, internet access is widely available even in low-income areas due to the expansion of commercial cybercafés known as *cabinas publicas*.[10 11] By January 2006, there were an estimated 10 million internet users in Peru (37% of the population) with 80% accessing the internet through *cabinas publicas*.[10 11] Due to the high marginalised nature of homosexuality, Peruvian MSM are shifting from physical to virtual places, not only to look for sexual partners but also to look for HIV health-related information.[12 13] Therefore, studying the feasibility of using the internet as a tool to access this population for health-related purposes is timely and necessary.

The aims of this study were to collect self-reported risk behaviours for HIV and other sexually transmitted infections (STIs), to assess format preferences for receiving risk-reduction interventions, and to assess whether offering free HIV/syphilis tests as compensation increases the frequency of participation in our online survey. To our knowledge, this is the first study conducted in Latin America and one of the first studies conducted in the developing world that explores using a Web-based intervention for MSM.

METHODS

This research was an observational, cross-sectional study whose target population was visitors to the gayperu.com website (http://www.gayperu.com), one of the most frequently visited gay websites in Peru. Our study offered two animated banner ads advertising our survey. Both banners were displayed at random and in equal proportions, the message of each banner differing only in that one offered free HIV/syphilis testing and condoms as compensation, and the other did not. When participants clicked on one of the banners, they were taken to that banner's website and from there to the survey.

The surveys assessed demographic characteristics, sexual and non-sexual risk behaviours for STI, and attitudes and opinions about health interventions. In the surveys that belonged to the web page that offered free tests, we gave the participants the option of generating a code by typing the first two letters of

Abbreviation: MSM, men who have sex with men

their last name, the first two letters of their mother's first name, the first two letters of their father's first name, and the day they were born. This code was stored in our database and was later matched with the one each participant disclosed during the interview when participants attended our clinic. In this way, we could compare them with participants who did not attend. After a written informed consent and a pretest counselling session, we conducted an ELISA and Rapid Plasma Reagin test for the evaluation of HIV and syphilis, respectively.

Data analysis was conducted using SPSS 13.0 software. Chi square and Fisher's exact test were performed to assess differences in reported behaviours, and t tests were used for comparison of means. The odds ratio (OR) and its 95% confidence interval were calculated using logistic regression.

Our proposal was approved by the Institutional Review Board of the University of Washington in Seattle and Vía Libre and Universidad Peruana Cayetano Heredia, both located in Lima, Peru

RESULTS

From 7 January to 4 April 2006, the banners that offered and did not offer free tests were displayed 12,240 and 12,232 times, respectively. The number of clicks on the incentivised banner and the number of surveys completed from this banner were higher than those from the non-incentivised banner (table 1).

The mean age of the sample was 26 years (range 18 to 67), and 87% reported Lima, Peru as their place of residence. Regarding their sexual orientation, the majority of respondents were homosexual (71%), while a substantial group was bisexual (29%).

Overall, 82% of the participants sought sex on the internet during the last year, and 58% reported using the commercial cybercafés as their primary place of internet access, with 10 participants reporting having had their last sexual intercourse inside a private module of a commercial cybercafé.

Participants who completed the survey that offered and did not offer free tests

Fifty per cent (334/670) of participants who completed the incentivised survey self-reported no prior HIV test, compared with 38% (143/375) of participants who completed the non-incentivised survey ($p<0.001$). The demographic characteristics, sexual orientation, sex seeking behaviour and self-reported STI of participants who filled the survey that offered and did not offer free tests were similar. Additionally, both groups had similar profiles of last sexual partners in terms of gender, HIV status, place of first meeting and frequency of drug use during the last sexual intercourse (data not shown). Nevertheless, participants who answered the survey that offered free tests had a higher percentage of anal receptive unprotected intercourse (57.6% vs 42.9%; $p = 0.001$).

Comparison of participants who had tested and not tested previously for HIV

For the sample overall, 54% (568/1045) of participants had previously tested for HIV, while 46% (477/1045) had not done so. Participants who had not previously tested for HIV were younger (25 vs 28; $p<0.001$) and less educated ($p<0.001$) than previously tested participants. Compared with those who had previously tested for HIV, significantly more of those not tested self-reported risk behaviours, such as sex with casual partners, anal receptive and vaginal unprotected intercourse, and sex with partners of unknown HIV status (table 2). Additionally, participants not tested were less likely to have discussed HIV with their last sexual partner and more likely to have had sex with an internet partner during the last year (70% vs 64%; $p = 0.04$). Although both groups had similar frequencies of self-reported STI during the last year, participants not previously tested had fewer STIs diagnosed by a healthcare provider; this difference was only significant for syphilis (table 2).

Characteristics of participants who attended our clinic to be tested for HIV and/or syphilis

Overall, 713 participants completed the survey that offered free tests, and 11% (80/713) attended our clinic, Of those who attended, 6% (5/80) were already diagnosed as having HIV, 5% (4/73) tested positive for HIV, and 8% (6/78) tested positive for syphilis. We were able to identify the online surveys of 70 out of 80 participants who attended our site; the remaining participants (10) did not create a code, or the code they gave us did not match any of the codes stored in our database. The variables associated with clinic attendance were having had a previous HIV test (odds ratio, OR = 1.94, 95% CI = 1.14 to 3.31) and having had anal insertive unprotected sex at their last intercourse (OR = 3.76, 95% CI = 1.54 to 9.17). Interestingly, none of the 12 participants who had a last HIV-positive sexual partner came to our site.

Regarding the preferences for receiving risk-reduction interventions, 93.7% were interested in a web page, 87.4% in chat rooms, 83.4% in emails, 83.1% in e-groups and 60.2% in mobile-phone text messages.

DISCUSSION

The development and implementation of a Web-based survey targeting MSM in Peru is feasible. In our study, the inclusion of free HIV and syphilis testing and condoms in one of the banners increased the frequency of participation, indicating that MSM were interested in these types of incentives. We provided neither monetary compensation for participation nor additional resources to cover the cost of transportation to our site. Previous studies conducted in the United States usually provided monetary compensation to participants in the form of electronic funds, e-gift certificates, or traditional funds via cheque.[8] In developing countries, economic restrictions as well as institutional review board regulations that restrict the amount of money that can be given to participants are major issues when considering compensation for participation. Using a health compensation, such as an HIV test, provided for free only at a very limited number of STI clinics in Peru, proved to be useful in our study.

While the inclusion of a health incentive increased the overall frequency of completed surveys, those who clicked on the banner offering testing sent a significantly lower proportion of surveys compared with those who clicked on the banner that did not offer free tests. This could be due to different

Table 1 Summary of results from the incentivised and non-incentivised banner

	Banner offering free tests n (%)	Banner not offering free tests n (%)	p value
Delivered impressions	12,240	12,232	
Clicks on each banner	6570 (53.7)*	2070 (16.9)*	<0.001
Surveys received	713 (5.8)*	411 (3.4)*	<0.001

*Percentage of delivered impressions.

Table 2 Characteristics of participants who were and were not tested previously for HIV

Characteristics	Previously tested for HIV (n = 568) n (%)	Previously not tested for HIV (n = 477) n (%)	p value	Total (n = 1045) n (%)
Type of last sexual partner				
Stable	182 (32.3)	116 (24.6)	0.04	298 (28.8)
Casual	215 (38.2)	208 (44.2)		423 (40.9)
Anonymous	132 (23.4)	121 (25.7)		253 (24.5)
Commercial	34 (6.0)	26 (5.5)		60 (5.8)
Unprotected sex last intercourse				
Anal insertive unprotected intercourse	98 (48.0)	74 (53.6)	0.31	172 (50.3)
Anal receptive unprotected intercourse	138 (46.9)	160 (57.8)	0.01	298 (52.2)
Vaginal unprotected intercourse	12 (50.0)	18 (85.7)	0.01	30 (66.7)
HIV status of the last sexual partner				
HIV positive	10 (1.8)	3 (0.6)	<0.001	13 (1.3)
HIV negative	191 (34.5)	90 (19.1)		281 (27.4)
Unknown HIV status	353 (63.7)	377 (80.2)		730 (71.3)
Discussed about HIV with last sexual partner				
Yes	268 (48.4)	146 (31.3)	<0.001	414 (40.4)
No	286 (51.6)	324 (68.9)		610 (59.6)
Self-reported STIs symptoms during the last year				
Dysuria	118 (21.0)	102 (21.9)	0.72	220 (21.4)
Urethral/anal discharge	42 (7.5)	45 (9.7)	0.21	87 (8.5)
Genital ulcers in penis or anus	57 (10.1)	50 (10.8)	0.74	107 (10.4)
STIs diagnosed by a health provider during the last year				
Gonorrhoea	25 (4.6)	18 (3.9)	0.59	43 (4.3)
Chlamydia	9 (1.7)	4 (0.9)	0.27	13 (1.3)
Syphilis	21 (3.9)	8 (1.7)	0.05	29 (2.9)
Herpes in penis or anus	35 (6.2)	23 (4.9)	0.38	58 (5.6)

expectations from those clicking on the banner offering free testing.

The banner ad that offered free tests as a compensation increased the frequency of participation of MSM not tested for HIV and MSM who had a higher frequency of anal receptive unprotected intercourse. This finding is important because, in the MSM population, those who are the receptive partner have the highest HIV prevalence (16.6%) compared with either versatile (both insertive and receptive, 12.9%) or insertive (6.5%) MSM and, therefore, will benefit the most from being tested (personal communication with Goodreau S, October 20, 2006).

Overall, MSM self-reported a high frequency of anal insertive (50.3%), and anal receptive unprotected intercourse (52.2%). These frequencies are higher than what has been reported in previous internet studies: Evans *et al* found 45% of unprotected anal intercourse (UAI) on MSM recruited through gay websites in Great Britain,[14] and Chiasson *et al* found 23% of UAI on MSM recruited on US and Canadian gay websites.[15]

Compared with participants previously tested, untested MSM had a higher frequency of risk behaviours, such as anal receptive and vaginal unprotected intercourse, as well as sex with partners of unknown status. Since our study design is cross-sectional and we cannot establish temporality, this difference could be attributed to either the effect of HIV counseling and testing on the subsequent decrease in risk behaviours, or the existence of a high-risk population less likely to seek HIV testing.[16 17]

Our study participants had the opportunity to present themselves to our study clinic to be tested. Eleven per cent of participants who self-reported having completed the online survey with incentive attended our clinic. The low percentage of attendance may be explained by the untailored nature of the invitation for the HIV/syphilis testing, the lack of online engagement dialogue with study personnel, the absence of email reminders, fear of a positive test result, perception of low risk for HIV infection, fear of breaching of confidentiality and location outside the city.[8 18–20] Of note, the individuals who followed through with testing tended to be more engaged in their health (ie, had been previously tested, as opposed to those who had not been previously tested) engaged in insertive anal sex as opposed to receptive anal sex. This may be explained by a possible higher self-marginalisation of receptive MSM, greater fear among this group of receiving a positive test, or other factors unknown to us. Understanding how best to reach the latter higher-risk group with testing services is our goal with future research.

Our study has some limitations; first, our sample is not representative of the MSM population from Lima or Peru, and also may not represent the entire online population of MSM who visit all available Peruvian gay websites. Second, our sampling is likely to be biased in terms of educational background and age. Third, we cannot establish temporality of events, since this is a cross-sectional study. Fourth, we were not able to collect data about participants who attended other clinics to receive testing. Fifth, we may have self-misrepresentation of some participants. Sixth, we may have duplicate entries from the same individual. Strengths include the effectiveness design (ie, no financial incentives offered for study participation).

In conclusion, this project has demonstrated that in Peru it is feasible to collect online data about risk behaviours for HIV/STI on high-risk MSM populations. The inclusion of free HIV/syphilis tests as a compensation for participation without any additional monetary payment increased the frequency of participation in our online survey, attracting high-risk MSM not tested for HIV but interested in a wide variety of preventive Web-based interventions. Future studies should develop and test tailored online interventions to increase both HIV/STI testing and delivery of other prevention services to Peruvian MSM.

ACKNOWLEDGEMENTS

Special thanks to the staff of Vía Libre for their enthusiasm and technical assistance.

CONTRIBUTIONS BY AUTHORS

MB and IA contributed to the development of the proposal, data collection, data analysis, literature review, outline, writing and review of the paper. RC contributed to the development of the proposal, data collection and review of the paper. PG, CC, MR, AMK, RR and AEK contributed to the development of the proposal, outline and review of the paper.

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Funding: This study was supported in part by the University of Washington Amauta Health Informatics Research and Training Program, a Fogarty International Center/NIH funded grant (D43TW007551) and the Fogarty/Ellison Fellowship, an NIH training grant (D43TW00007). The sponsor was not involved in any part of the study.

Competing interests: None.

Disclaimer: The full text of this study has not been published before in print or electronically.

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